



APPENDIX A

PERFORMANCE REVIEW CHECKLIST/TOOLKIT

Annual hub performance reviews/evaluations will be conducted by MTC at each of the major regional transit hubs to implement recommended hub-related improvements. In addition, there are recommended systemwide connectivity improvements – the 511 program and fare coordination – that will also be implemented.

This appendix is organized into two main elements:

1. specific requirements for hub-related improvements and systemwide connectivity improvements
 - Appendix A1- Wayfinding Signage Checklist
 - Appendix A2 – Transit Information Display Case Requirements
 - Appendix A3 – 511/Real-time Program Requirements
2. recommended guidelines and standards that should be followed in order to implement recommended hub-related improvements
 - Appendix A-4 – Connectivity Guidelines
 - Appendix A-5 – Last Mile and Hub Amenities Checklist
 - Appendix A-6 – Hub Activity Survey
 - Appendix A-7 – Hub Schedule Adherence Survey

The hub-related and the systemwide improvement recommendations included in the study and this appendix constitute the Transit Connectivity Plan that will be incorporated into MTC's Transit Coordination Implementation Plan pursuant to Street and Highway Code Section 30914.5 (as promulgated by RM2) and Government Code Section 66516.5.

RM2 stipulates that the transit operators must comply with the connectivity plan recommendations in order to receive STA funds and RM2 funds identified for designated projects/operators. This plan recommends that MTC monitor compliance at the 12 hubs with the implementation plan; the intent is to eventually ensure compliance for all 21 hubs identified as part of the regional network within the next 5 – 7 years.



APPENDIX A-1

WAYFINDING SIGNAGE

The wayfinding signage checklist is intended for use in evaluating the current characteristics of a hub and defining existing problems and issues. The checklist is designed to produce an action list of wayfinding signage.

In evaluating the completed checklists, a “No” answer identifies a deficiency at the transit hub. Supplemental notes would be provided documenting the nature of the deficiency. Technical Memorandum # 4 (see Appendix B) includes guidelines and standards that should be followed to address identified deficiencies. The hub owner, in coordination with MTC and the connecting operators, would develop a plan, cost estimate, funding plan and implementation schedule for the necessary wayfinding system improvements based on the performance review.

Checklist for the Evaluation of Transit Hub Connectivity		
Yes	No	
Identification of station or transit operator		
<input type="checkbox"/>	<input type="checkbox"/>	The hub is clearly identified, visible from surrounding roadways by vehicular and pedestrian traffic.
<input type="checkbox"/>	<input type="checkbox"/>	Entrances into the hub are clearly identified, visible from approaches by vehicular and pedestrian traffic.
<input type="checkbox"/>	<input type="checkbox"/>	Transit operators serving the hub are clearly identified at the entrances with their logo and name.
<input type="checkbox"/>	<input type="checkbox"/>	Station identification reinforces information on printed maps and schedules.
<input type="checkbox"/>	<input type="checkbox"/>	Station name is identified on the entrance sign along with agency logo.
Moving around or entering or exiting the station		
<input type="checkbox"/>	<input type="checkbox"/>	Agency logos included with names on directional signs within the facility.
<input type="checkbox"/>	<input type="checkbox"/>	Turnstile level street exit directional signs also include connection agency names and logs.
<input type="checkbox"/>	<input type="checkbox"/>	Vital connections information is grouped together on signs.
<input type="checkbox"/>	<input type="checkbox"/>	Connection directions are provided at each decision point and there are no gaps in the connection directional information flow.
<input type="checkbox"/>	<input type="checkbox"/>	Exiting connection information is color-coded yellow background to emphasize and make easier to find directions to connections on signs.
<input type="checkbox"/>	<input type="checkbox"/>	Exiting directional signs list a hierarchy of the popular destinations from that point and connecting services to reach these destinations.
<input type="checkbox"/>	<input type="checkbox"/>	In stations with multiple track/gate train/ferry service, confirmation of agency, destination, and real-time departure associated with track/platform/gate directions is provided.
<input type="checkbox"/>	<input type="checkbox"/>	In urban settings where connecting transit service is not immediately outside the station exit, guidance to the on-street walking direction and distance is provided.
<input type="checkbox"/>	<input type="checkbox"/>	Clear sightlines are maintained to signs and the bottom of signs is no higher than 9 feet.

Checklist for the Evaluation of Transit Hub Connectivity		
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	Signs are legible with adequate message size appropriate for viewing distance, proper contrast ratios, and illumination levels.
<input type="checkbox"/>	<input type="checkbox"/>	Arrows are bold in visual balance with text and closely associated with their messages.
<input type="checkbox"/>	<input type="checkbox"/>	Clear directions are provided to nearby connecting bus stops.
Identification of where to board or wait for transit		
<input type="checkbox"/>	<input type="checkbox"/>	Bus boarding platforms are clearly and boldly identified with letters.
<input type="checkbox"/>	<input type="checkbox"/>	Bus boarding areas distinguish different boarding points for the same route depending upon direction of travel using route number, name, and route terminus (a place name).
<input type="checkbox"/>	<input type="checkbox"/>	Where a particular bus route utilizes different boarding points, or platforms for opposite directions of travel directional signage for the different boarding point, platform route number, name, and route terminus (a place name) is provided.
<input type="checkbox"/>	<input type="checkbox"/>	Commuter rail station platform track identification number is large and bold with service agency, destination, number, and "real-time" departure associated with track identification number is provided.
<input type="checkbox"/>	<input type="checkbox"/>	Bus stop signs have agency logos large and bold.
<input type="checkbox"/>	<input type="checkbox"/>	Bus stop signs have accessibility and parking restrictions as auxiliary signs below the basic bus stop signs.
<input type="checkbox"/>	<input type="checkbox"/>	At off-street bus stops, a current bus frequency schedule with last bus listing and route line map is provided at levels per ADA specification.
<input type="checkbox"/>	<input type="checkbox"/>	Bus route identification on bus stop signs comply with 2004 ADAAG Guidelines - minimum 2" route number character height.
<input type="checkbox"/>	<input type="checkbox"/>	Bus stop sign faces are visible from each approach direction.
<input type="checkbox"/>	<input type="checkbox"/>	Bus shelters have associated bus stop signs with attributes described in preceding 5 checklist items.

Checklist for the Evaluation of Transit Hub Connectivity		
Yes	No	
Transit Information for Pre-Trip and Enroute Planning		
<input type="checkbox"/>	<input type="checkbox"/>	Posted transit information (i.e. maps, schedules) is well maintained, accurate and easy to find.
<input type="checkbox"/>	<input type="checkbox"/>	Schedules, fare, transfer information and hub layout maps are located near bus stops and loading platforms.
<input type="checkbox"/>	<input type="checkbox"/>	Hub specific information is provided in an adjacent case to the Regional Transit Information Display Case as well as locations throughout the hub.
<input type="checkbox"/>	<input type="checkbox"/>	Hub layout maps are provided in the hub information display case.
<input type="checkbox"/>	<input type="checkbox"/>	Map of hub vicinity with landmarks and attractions is posted in the hub information case.
<input type="checkbox"/>	<input type="checkbox"/>	Transit operator and route maps for the nine-county San Francisco Bay Area are posted in the Regional Transit Information Display Cases.
<input type="checkbox"/>	<input type="checkbox"/>	Transit information in Regional Transit Information Display Cases is accurate and easy to read
<input type="checkbox"/>	<input type="checkbox"/>	Printed schedules and maps distributed at the hub contain the most recent and accurate information and are consistent with the information in the Regional Transit Information Display Cases.



APPENDIX A-2

TRANSIT INFORMATION DISPLAY CASE REQUIREMENTS

MTC previously installed 144 RTIC display cases throughout the region. Some cases are in disrepair and the process for keeping contents up-to-date has been ill-defined. This proposal assigns responsibility for maintaining cases and keeping contents current.

Overview of Proposed Concept:

1. MTC will provide some standard contents for the RTICs. The operators will provide agency-specific information.
2. The RTICs should maintain a consistent look so that they are recognizable as a source of regional transit and connecting service information.
3. The purpose of the standard materials provided by MTC is in part to create a regional look for the RTICs.
4. Because the RTICs can provide only limited information, another objective of the display contents is to promote 511 and 511.org as sources of more comprehensive transit information.
5. The status of the RTIC display cases and contents, and transit operator fulfillment of requirements, will be monitored through regular reviews.

Contents:

Each RTIC will include the standard content types listed below. The level of detail and amount of information will vary by location. Standard contents will include:

1. A **header** that reads “Connecting Transit Information.” (MTC)
2. Specific types of information, organized by **sub-header** where appropriate. The following types of information will be required at every location:
 - a. Schedule information for connecting services (provided by lead connecting operator)
 - b. Station area map (provided by MTC)
 - c. 511 information (provided by MTC)
 - d. Fare information

- e. Local area transit map (depending on display space available)
- f. Regional Transit Diagram (depending on display space available)

Responsibilities:

A single agency (e.g., lead transit operator) would be designated to lead regional RTIC implementation and maintenance either directly or through contractor assistance.

The status of the wayfinding signs and RTIC display cases and contents, and transit operator fulfillment of requirements, will be monitored through regular reviews as part of an annual assessment of the Transit Coordination Implementation Plan.



APPENDIX A-3

511/REAL-TIME PROGRAM REQUIREMENTS

MTC is committed to fund the full operability of a defined 511 system, but requires full participation of all the transit agencies to make it work. MTC has prepared a draft 511 Strategic Plan scheduled for Commission adoption in April 2006 that defines specific improvement strategies.

The following requirements will be incorporated into the SB 1474 Transit Coordination Implementation Plan. As such, transit agencies are expected to:

1. Transit Agency Support of 511/Real Time

- a. Deliver quality information for the 511 transit web site by providing timely and comprehensive schedule and route updates; routinely performing quality checks; and providing notification about changes to, and ongoing support for, the data exchange interface with 511 Transit:
 - i. Transmit schedule and other transit service information in advance of any schedule changes for inclusion in the Regional Transit Database (RTD). (For agencies using the XML data import/export schema, this means at least ten business days prior to the go-live date. For transit agencies using other data import/export strategies, this means at least 20 business days prior to the go-live date.)
 - ii. Each time new service data is provided, conduct a thorough and timely sample review of service data placed on 511 Transit's review website.
 - iii. Notify 511 staff of planned scheduling software changes as soon as the decision to procure new software is made. Require that any new scheduling software supports (or can be easily and efficiently adapted to support) the data exchange interface with the Regional Transit Information System. Conduct appropriate testing of data exchange prior to "going live" to ensure that the exchange process works well.
- b. Deliver quality information for the 511 phone system by providing timely notification of the following changes in pre-recorded information.
 - i. Notify 511 staff of changes in telephone information center hours, schedules, fares, and any other changes in pre-recorded transit service information.
 - ii. Notify 511 staff within fifteen minutes of reported transit service disruptions of regional significance. Provide updates to 511 staff on the status of service disruptions every half hour until regular service is restored.

- c. Notify transit customers of the availability of 511 information on transit agency web sites, in printed materials, and at bus stops/rail stations.
 - i. In order to promote the availability and understanding of the 511 service to the transit customer, place an easily identifiable link to either 511.org, transit.511.org or to the 511 TakeTransitSM Trip Planner on the transit agency's website home page and clearly identify the availability of the 511 TakeTransitSM Trip Planner as a complement to the agency's schedule and route information.
 - ii. For all new and reprinted schedule materials, direct customers to "Dial 5-1-1 or go to 511.org for regional transit connection information".
 - iii. Per the previous customer information recommendations, as old RTCC signs and RTIC display cases are replaced and new ones created at regional transit hubs, include information directing riders to call 511 or go to 511.org for regional transit connection information.
 - iv. Support maintenance of RTICs at transit hubs in accordance with processes defined in this study.
 - v. Guidelines for referring to 511 are provided in the 511 Style Guide, which will be provided to each transit operator.
- d. Subject to the final recommendations of the Real Time Transit Information program, transit agencies are to share their real-time predictions and configuration data on a timely basis for dissemination through outlets such as 511, 511.org, and regional real-time signs.
 - i. Adhere to the regional real-time transit information architecture, including support of the prediction and configuration data exchange interfaces between the transit agencies' real-time systems and the regional real-time system. The architecture will define refresh rates for prediction information and the requirement for automated data updates.
 - ii. Adhere to regional real-time signage guidelines per the final real-time transit information architecture document.
 - iii. Notify 511 staff of planned real-time transit system software changes as soon as the decision to procure new software is made. Require that any new said software supports (or can be easily and efficiently adapted to support) the data exchange interface of prediction and configuration data with the Regional Real-time Transit Data Store. Conduct appropriate testing of data exchange prior to "going live" to ensure that the exchange process works well.
 - iv. Satisfy regional accuracy thresholds for real-time data inputs to the regional database.



APPENDIX A-4

CONNECTIVITY GUIDELINES

The following connectivity guidelines are organized to respond to the existing deficiencies and problems identified within each hub through the evaluation checklist procedure. In cases where an answer to the checklist evaluation results in a “No” response, these guidelines can lead to the specific type of recommendation or tool to fix the problem. The recommendations provide implementation guidance and example concepts for planning and designing hub improvements with the intent of addressing connectivity issues. Some types of concepts are universally applicable among all four categories of hub type; others are tailored to the unique circumstances and conditions at only certain hubs and/or transit modes. The guidelines are presented in the following order:

- Wayfinding (see Technical Memorandum #4 for more guidance)

- Customer Use of Transit Information

- Schedule Coordination

- Real-time Technology

- Last Mile Connecting Services

- Hub Amenities and Infrastructure Improvements

The evaluation process identified four basic types of hubs as follows:

Type A: Urban Hubs with Buses Loading On-street

This type of hub is typically found in a major urban center or downtown. Usually this type of hub involves connections between regional rail services and local buses services. In this situation there is not ample land for off-street bus loading and the frequency of buses is high enough that timed transfers are not an issue. Examples of this type of hub in the Bay Area include:

Oakland City Center/12th St BART
Station

Ferry Terminal/Embarcadero BART
Station

Civic Center BART Station

Caltrain 4th St. & Townsend Station

Vallejo Intermodal Ferry Terminal

Type B: Urban Hubs with Off-street Bus Loading

Some urban transit hubs have sufficient land to provide an off-street bus loading area. These urban hubs tend to be in urban centers, which are not quite as dense as those included within the Type A designation. Bus service in these areas tends to be less frequent; the transit hub may well be the major activity center served by bus transit. Examples of this type of hub include:

Montgomery BART Station/Transbay
Terminal

San Jose Diridon Station

Palo Alto Caltrain Station

Mountain View Caltrain Station

Great America Caltrain Station

Type C: Bus Only Hubs

Bus only hubs are most common in suburban centers in areas removed from the regional rail network. Timed transfers and pulse bus operations are common at this type of hub, as buses tend to operate at 20 – 30 minutes headways or more. Examples of this type of hub include:

San Rafael Transit Center

Santa Rosa Transit Mall

Napa Intermodal Center

Fairfield Transit Center

Type D: BART with Off-street Bus Loading

Many BART stations have been developed with on-site intermodal terminals for the buses that serve the station. These terminals provide connectivity to and from BART, but they are also an important transfer hub for the bus services that converge there. Thus these hubs serve two functions: 1- Access to the regional rail network, and 2 – A local transfer center for buses. Examples of this type of hub include:

Dublin/Pleasanton BART Station

El Cerrito del Norte BART Station

Fremont BART Station

Richmond BART Station

Coliseum/Oakland Airport BART
Station

Millbrae BART/Caltrain Station

Pleasant Hill BART Station

WAYFINDING

Recommendation: Identify Station or Transit Operator

Tool: Transit center identification onto existing architecture visible to vehicular and pedestrian traffic.

Application Guidelines

Use at type A, B, and C hubs; not suitable for type D hubs.

Use where the function of the building is not obvious.

Expresses guideline for architectural interface and community acceptance whereby new identification signs are mounted on existing architectural structures.



Figure A-7.1
Proposed San Rafael Transit Center Identification

Tool: Add freestanding station entrance identification sign for urban rail station that provides identification of station entrance, agency and station name.

Application Guidelines

Use at type A urban and type D suburban hubs; not suitable for type B and C hubs.

Use in conjunction with underground station entrances.

Expresses guideline for facility name - including the station name and agency logos to reinforce information on maps and printed aids.



Figure A-7.2
Proposed Embarcadero Station entrance identification

Recommendation: Provide Direction for Moving around or Entering and Exiting the Station

Tool: Directions to station exit and nearby transit connections accessible via exit with face panels that emphasize connections using features that improve functionality, i.e., color coding, agency logos, bolder arrows, etc.

Application Guidelines

Use at type A and B hubs; not suitable for type C and D hubs.

Use where there are multiple connection agencies.

Add signage within station or on-site to fill in directional gaps and link signage into a cohesive directional system.

Expresses guidelines for:

- color coding for exiting connection information
- directions to services include agency logos associated with names
- integration of connectivity messages with existing signage
- vital connection information grouped together
- guidance as to on-street walking distance



Figure A-4.1 Proposed Embarcadero Station exit directions - use of logos to reinforce directions to services

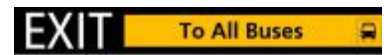


Figure A-4.2 - Proposed Exit Information

Tool: Directions to agencies within the facility using agency logos in addition to names on existing directional signs to reinforce identity of agency and exterior signage identification.

Application Guidelines

Use at type A, B, and C hubs, and type D hub (Millbrae BART/Caltrain).

Use at hubs having multiple agencies with common traffic circulation.

Expresses guidelines for:

- agency logos reinforce names
- integration of connectivity messages with existing signage
- bolder, more legible arrows



Figure A-9.1 Proposed Embarcadero Station Transit Service directional signage

Tool: Exit directions to connecting bus services using more visible signage for exit directions to connecting bus services.

Application Guidelines

Use at type D hubs; not suitable for type A, B, and C hubs.

Use at hubs having multiple agency off-street bus loading.

Use yellow to compensate for low illumination level at sign mounting locations.

Expresses guidelines for:

- color coding for exiting connection information
- new directional signs mounted on existing architectural structure
- vital connection information (agency and routes) grouped together in layout
- new signs legible under all lighting conditions



Figure A-6.2
Proposed Dublin/Messanora DART Station exiting directions

Tool: On-street walking directions to nearby connection services using urban multi-directional “connector locator” blade signs outside the station exits to provide on-street walking directions to nearby connection services. This concept utilizes an off-the-shelf APCO “sign point” multidirectional sign system. Use at type A and B hubs; not suitable for type C and D hubs.

Application Guidelines

Use in major urban centers where Omni pedestrian directions are required.

Use outside station exits to start pedestrians walking in the right direction.

Use at Ferry Terminal exit to provide on-street directions to nearby on-street bus stops or regional rail services.

Use at key urban intersections to provide directions to downtown hubs with regional rail or ferry service.

Use in major urban centers with a high concentration of pedestrian traffic and on-street bus stops.

Expresses guidelines for:

- urban directions – provide guidance to on-street walking direction and distance
- color coding of connectivity information and use of agency logos



Figure A-8.1
Proposed Urban Multi-Directional
“Connector Locator”

Recommendation: Identify where to Board or Wait for Transit

Tool: Clear identification of bus platform easily distinguished from other bus route information using bolder, larger bus platform identification visible from other platforms. Use color-coding to distinguish platforms.

Application Guidelines

Use at type C hub; not suitable for type A, B, and D hubs.

Expresses guidelines for:

- at bus transfer centers with multiple bus boarding platforms. Each platform shall be clearly and boldly identified. Color-coding should be considered.



Figure A-10.1
Proposed San Rafael Bus Transfer Center - typical platform ID

Tool: Clear directions for where a particular bus route utilizes a different platform for opposite direction of travel.

Application Guidelines

Use at type C hub; not suitable for type A, B, and D hubs.

Use directional and identification signs that emphasize connections, i.e., platform/track identification, direction of travel, routes, etc.

Expresses guidelines:

- route number, terminus, and color coding included in directions
- new sign is coordinated with existing sign design and mounted on existing architectural canopy



Figure A-10.2
San Rafael Bus Transfer Center (view from Platform B)
Proposed bus boarding identification Northbound and Southbound
Route 26 & 27 board on different platforms

Tool: Bolder, larger bus stop identification visible for pedestrian traffic.

Application Guidelines

Use at type B and D hubs; not suitable for type A and C hubs.

Use signs that emphasize connections and improve legibility, accessibility, and functionality, i.e., bolder agency logos/colors, uniform layouts, current bus frequency, route line map, last bus listing, compliance with 2004 ADAAG Guidelines, etc.

Expresses guidelines for:

- bolder, larger bus stop identification with agency logo and colors
- color-coding of connectivity information (yellow background)
- current bus frequency schedule with last bus listing posted



Figure A-11.1
Proposed Dindon Station ID of DASH free shuttle service stop

Recommendation: Provide Orientation to Surroundings beyond the Station

Tool: Reinforcement of agency/service identity with on-street identification signage.

Application Guidelines

Use at type A hubs and any on-street or printed visitor maps.

Add agency logos to identify stations and major stops on existing urban visitor maps to create awareness of services, their stops, geographic relationship, and reinforce on-street identification signage.

Expresses guideline for agency identity reinforcement to create awareness of service in geographical relation to destinations.



Ferry Terminal Informational Sign

Tool: Localized area map with emphasis upon nearby bus stops, destinations, and connectivity information.

Application Guidelines

Use at type A, B, and C hubs; not suitable for type D suburban hubs.

Use area maps that emphasize connections and include a simplified area map with destinations/transit agency/route listing, and nearby bus stops

Include extensive use of agency logos, walking time rings, and other features that create awareness and provide orientation to nearby bus boarding locations

Expresses guidelines for:

- map focused upon localized transit connections within a reasonable walking distance
- destinations, agency logos and route numbers are listed
- agency logos used to identify stations and bus stops
- “You are here” indicator and walking rings shown
- Color coding (yellow) of map heading



Figure A-11.2
Proposed Embarcadero Station Bus Boarding Locations

Tool: Easy-to-see reference for how to reach popular local and regional destinations nearby transit services. Add destination locator matrix signs at large hub stations that provide a comprehensive alphabetical destination to destination listing similar to that used on highway map mileage charts. Connecting services are located where the destinations intersect.

Application Guidelines

Answers question: “WHAT” service do I use for connection to reach my destination?

Use at type A, B, C, and D hubs in varying forms.

Expresses guideline for development of new information aid to respond to a key connectivity wayfinding information need.

Getting from here to there - Bakersfield/Harry Building

DESTINATION	BART	Ride			
		Cable Car	Bike Share	Bus	Metrolink
AT&T Park					
Chico State					
CHICO STATE					
Fisherman's Wharf					
Fort Mason					
Golden Gate Park					
Marina Center					
St. Francis Hospital					
St. Mary's Medical Center					
San Francisco					
Union Square					
University of San Francisco					

Tool: Maps at local and regional scale with emphasis upon connectivity information.

Application Guidelines

Reorganization is done on a case-by-case basis and requires simplification of maps.

Focus reorganization on connections within reasonable walking distance

Use at type A, B, C, and D hubs.

Expresses guideline that existing transit maps and information, in general, need a major overhaul and redesign to be simpler to use, easier to understand, and to emphasize connectivity.



San Rafael Maps and Schedules

Tool: Revised kiosk display panels providing information on how to use the service and make intra- and inter-agency connections.

Application Guidelines

Use at type A, B, C, and D hubs.

Add/update information as needed.

Expresses guideline for freestanding kiosks providing information on how to use the transit service, schedules, fares, and acknowledgement that connections to other agencies are possible.



Recommendation: Provide Real-time Transit Information

Tool: Real-time transit information and track identification at multi-agency transit facilities.

Application Guidelines

Use at type A and B hubs and type D (Millbrae BART/Caltrain) hub.

Include real-time signage at multi-agency transit facilities to indicate service agency, destination of train (or bus), level of service, and actual or countdown (if feasible) departure time.

Expresses guidelines for:

- real-time signage indicating service agency, destination (including whether or not it is an express service), , and departure prediction
- new sign incorporates existing static sign information, i.e., track number and accessible route to platform



Figure A-13.1
Proposed Dublin Rail Station directions to platform

Tool: Real-time transit information at a stop for a single agency.

Application Guidelines

Use at type A, B, and D hubs; not suitable for type C hubs.

Signs can be used in train stations or at individual bus stops at hubs.

Replaces train/bus line diagram graphic where customer has to figure out where the train/bus is with a simple statement of next train(s)/bus(es) destination and departure time.



Figure A-13.2
Proposed Dublin/Pleasanton BART Station Real Time train information at entry lobby

Expresses guidelines:

- departure time for line terminus or arrival time for intermediate stops per train/bus in each direction
- destination of train(s)/bus(es)
- large, easy-to-read countdown display – the key piece of information
- new display is integrated with existing dynamic sign locations outside the paid area

CUSTOMER USE OF TRANSIT INFORMATION

Recommendation: Provide Transit Information for Pre-Trip and Enroute Planning

Tool: Posted Transit Information

Application Guidelines

Regional transit information

- Includes transit operator and route maps for the nine-county San Francisco Bay Area
- Uses easily recognizable logo and consistent format
- Placed in central location in the hub
- Provides accurate and up-to-date information, consistent with printed materials distributed at the hub
- Includes 511 phone service and 511.org contact information
- Information in multiple languages

Local hub specific information

- Includes accurate schedule, fare and connection information
- Includes hub layout map showing location of transit loading locations identified by operator, route and destination
- Placed at multiple locations in hub as close as possible to the bus stops and/or station loading platforms for easy reference by connecting passengers as well as location of fare payment locations, restrooms, taxi stand, shuttle stops, etc
- Map of the hub vicinity to include surrounding roadways, locations within walking distance, off-site transit connections, etc
- Information in multiple languages, at minimum the languages spoken by population most frequently using the hub

Tool: Printed transit information

Application Guidelines

Schedules and maps containing accurate, up-to-date information for all routes using the hub.

Distributed at central location

Station agents with access to all routing and schedule information for all operators that provide hub service

Materials provided in multiple languages as applicable

Recommendation: Provide access to 511 Phone Service and/or 511.org

Tool: Dedicated 511 phone

Application Guidelines

Include 511 information on posted materials

Pay phones with 511 information

Direct access 511 phone

– Provide in central location

Tool: Contact information to 511.org

Application Guidelines

Posted and printed materials to include 511.org contact information

Consider information kiosk connection

SCHEDULE COORDINATION

Recommendation: Focus coordination efforts on infrequent service and last trip of day transfers.

Tool: Schedule coordination for infrequent service and last trip of day transfers

Application Guidelines

Prioritize upgrading service to 15 minute or better headways on major regional trunk transit services as permitted by funding resources.

Offset transit schedules to favor transfers to long headway routes and to last bus trip of the day services allowing 5 minutes plus the transfer deboard and walk time for the maximum transfer distance for off-peak connections and 8 minutes plus maximum transfer time for last trip connections.

Where services and facilities allow located end of line layovers at key transfer hubs and synchronize schedules to “nest” within the scheduled layover.

Last trip of the day transit trips should be synchronized with specific outbound regional transit trunk service trip.

Recommendation: Reduce physical separation of services in hubs through transfer surveys, reallocation of routes and physical changes

Tool: Survey to identify major passenger transfer movements at hubs.

Tool: Survey to determine the maximum amount of time required to complete transfers at the hub including the amount of time need to exit arriving vehicle and walk to transfer vehicle - (for wheelchair patrons and for ambulatory patrons).

Tool: Survey to identify those transfers that can be made within a two-minute interval and those that cannot (bus bay to bus bay etc).

Application Guidelines

Assign bus passenger loading bays to maximize short distance transfers and to ensure last trip transfer connections can be made.

Identify and then minimize physical barrier related delays including vertical circulation delays, fare payment delays, fences etc.

Ensure compliance with ADA requirements re transfer connections.

Recommendation: Institute schedule adherence service reliability monitoring at the hubs using real-time technology

Tool: Passenger perspective objectives, measures and monitoring program for schedule adherence at hub.

Tool: Real time technology on all buses, trains and boats serving the hub.

Recommendation: Regional Rail Plan schedule coordination

Tool: Meet objectives of Regional Rail Plan schedule coordination

Application Guidelines

For stations identified by the Regional Rail Plan as a desired transfer coordination station, identify the key passenger transfer connections.

Provide cross platform transfers in the station design and train platform assignments.

REAL-TIME TECHNOLOGY

Recommendation: Provide real-time information at transit hub

Tool: Placement and control of real-time signage to maximize effectiveness

Application Guidelines

Real-time signs should be placed at hub entry points outside of pay areas.

The real-time signs should provide the proper illumination of messages in order for the customers to see it, regardless of the lighting conditions.

Real-time message signs should allow for the keyboard entry of information to be displayed and/or announced over and above any automatic message interfaces.

The real-time signs should be located close to a source of power, or a new power source will need to be installed.

It is desirable to have all real-time signs within a hub networked together in order to have a single point of communications to the 511 system to reduce communications costs.

Some hubs are large or complex enough that multiple regional real-time signs may be deemed necessary. To the extent possible, locations of these should be located along access ways to platforms, mezzanine levels within hubs, or adjacent to way-finding signs or other dynamic schedule signs.

Tool: Content of real-time signage

Application Guidelines

At the regional hubs, the real-time signs should display real-time arrival/departure information from multiple operators and multiple routes.

For hubs that have up to five existing public transportation operators, the real-time signs should accommodate the simultaneous display of up to six operators with real-time information.

For hubs that have more than five existing public transportation operators, the real-time signs should accommodate the simultaneous display of up to six operators with real-time information. If more than six operators are providing real-time information to the sign, the display should split the real-time information into two pages of displays, where each page will display up to six operators at a time.

A minimum of 20 routes with predictions shall be able to be displayed on each sign. Under this guideline, one operator can have 20 routes with predictions, or six operators can have 3 routes with predictions at a minimum.

When multiple operators have real-time arrival time predictions to display the real-time information will be organized alphabetically by operator name.

For each arrival/departure information, the operator's name will be displayed, then the route identification, route name and then the predicted arrival/departure time (See Figure 3). Only routes with predictions shall be displayed. If a route typically has predictions

and for some technical reason one is unavailable to the sign, then the statement, “Not available” will be listed on the sign.

If there are multiple operators with multiple routes, the information from each operator shall be organized by route number in ascending order with letter-named routes listed before numbers (or if no number exists, alphabetically by route name). If there are multiple predictions for a specific route, the predictions for that route will be displayed in ascending order starting with the shortest prediction time and ending with the longest prediction time.

The real-time transit information to be displayed should include the following at a minimum in the order presented:

- Transit operator icon (logo) – optional;
- Transit operator name (text);
- Route identification (alphanumeric);
- Route name (text);
- Arrival and/or departure prediction time (minutes)

The real-time signs should have the capability to display other text-based messages that are automatically or manually generated.

The signs should display predictions that are equal or less than 45 minutes.

Tool: Frequency of real-time signage information

Application Guidelines

The real-time predictions on the signs should be updated at least once every two minutes, or as soon as the regional data store receives updates from the operators, whichever comes first.

The sign should display a “Not Available” message if the updated predictions have not changed after 10 minutes.

LAST MILE CONNECTING SERVICES

The guidelines that address planning and designing hub improvements relative to Last Mile Connecting Services can be consistently applied to all of the four hub types described in this Chapter. The reason for this consistent application is that Last Mile Services are intended to be dynamic and responsive to the connectivity needs of transit customers, transit operators and local communities. The guidelines apply to deficiencies identified in the Connectivity Checklist.

Recommendation: Identify new markets, customer needs and preferences

Tool: New markets based upon customer needs and preferences and available new technologies.

Application Guidelines

Collect data and provide customer information by the various means identified in Chapter 3; Wayfinding, Customer information and Real-time Technology.

Design shuttle services to incorporate new technology, convenient connections, customer amenities, market and advertise new or expanded services.

Prepare a pedestrian circulation plan that includes performance measures, wayfinding and addresses local needs.

Prepare a bicycle parking and circulation plan that addresses pathways from each of the four quadrants that surround a transit hub, wayfinding and integration with regional bicycling facilities.

Encourage and market alternative commute modes and provide information to customers at regional transit hubs.

Recommendation: Identify funding, partnerships and a managing or lead agency

Tool: Funding and implementation plans for new markets

Creating a partnership between transit operators and local agencies or interest groups has proven effective in securing new and ongoing funding sources, managing new services and complementing existing or planned fixed-route transit services.

Work with counties and local agencies that have departments or advocacy groups, which are focused on improving and expanding pedestrian, bicycle and alternative transportation modes. Such groups are generally knowledgeable about funding and other implementation programs.

Coordinate with taxi operators, businesses and non-profit organizations to promote and advertise alternative mode access at regional transit hubs.

Recommendation: Identify service standards and coordinate with local planning efforts:

Tool: Service standards and benchmarks

Use the service standards and benchmarks provided in the Plan for Last Mile Connecting Services to coordinate with transit operators, locate shuttle stops, provide wayfinding and other customer amenities at regional transit hubs.

Apply the checklist standards to address improvements for pedestrian, bicycle and taxi connections.

Local agencies should address transit connectivity, pedestrian and bicycle access issues in their planning and funding documents and processes.

HUB AMENITIES AND INFRASTRUCTURE IMPROVEMENTS

The following hub amenities and infrastructure improvements are applicable to all of the four hub types categorizing regional transit hubs. The specific application (i.e. quantity, location, design) will depend upon the number of passengers and transit services passing through the hub and the physical design and layout of the hub.

Recommendation: Connectivity of transit services-physical connections

Convenience and scheduling of transit connections is largely dependant upon the actual physical layout of the hub and the time and distance required for passengers to make the transfers. This issue is discussed in the Schedule Coordination section of this report. The tools and application guidelines presented in that discussion and other related to infrastructure improvements are included here.

Tool: Survey to identify major passenger transfer movements at hubs.

Tool: Survey to determine the maximum amount of time required to complete transfers at the hub including the amount of time need to exit arriving vehicle and walk to transfer vehicle - (for wheelchair patrons and for ambulatory patrons).

Tool: Survey to identify those transfers that can be made within a two-minute interval and those that cannot (bus bay to bus bay etc).

Application Guidelines

Assign bus passenger loading bays to maximize short distance transfers and to ensure last trip transfer connections can be made.

Identify and then minimize physical barrier related delays including vertical circulation delays, fare payment delays, fences etc.

Ensure compliance with ADA requirements re transfer connections.

Recommendation: Weather Protection

Tool: Shelters and canopies for protection from wind rain and sun

Application Guidelines

Provide at all waiting areas including those for buses, rail, ferries, taxis, passenger loading and shuttles.

Provide along connecting pedestrian routes between transit loading areas.

Designed to provide maximum shelter from wind, rain and, where appropriate, sun.

Designed so waiting passengers can see oncoming vehicles to the transit stop.

Recommendation: Seating Areas

Tool: Seating areas for passengers waiting to make connections

Application Guidelines

Ample seating for volume of waiting passengers

In visible areas within sight of station agents and security personnel for safety of passengers

Protected from wind, rain and, where appropriate, sun.

Clean and in good repair

Able to see transit vehicles from seating

Located to not hamper pedestrian flows

Tool: Lean on railings

Application Guidelines

Used as supplement to other seating

Located to not block access to transit vehicles especially for wheelchair or mobility impaired passengers

Recommendation: Audio Announcements

Tool: Audio announcements of transit arrivals and departures, service delays and emergency announcements

Application Guidelines

Clear and loud enough for customers to hear and understand

Supplement to real-time signs

Recommendation: Restrooms

Tool: Restrooms for use of passengers

Application Guidelines

Central location clearly signed

Clean and safe for passenger use

Directions to nearest alternative facilities provided when restrooms closed

Recommendation: Safety and Security

Tool: Safe and secure environment without risk to personal safety

Application Guidelines

Pedestrian routes visible to other station users, station agents and security personnel

Avoid the need for pedestrians to cross through bus zones or parking lots

Use highly visible pedestrian crossings with boldly marked crosswalks, signals with pedestrian countdown signals and audible signals

Discourage use designs, which include pedestrian tunnels

Enhanced lighting in parking lots, parking structures, walkways, bus stops and stations

High visible presence of station agents or security personnel

Waiting areas in view of station agents or security personnel

Avoid dark corners 'lurking points'

Provide lighting at a pedestrian scale, avoiding dark areas along pedestrian paths.

Use of CCTV and video surveillance

Security for vehicles parked at the station

Increase use of the hub, especially at off-peak times, with incorporation of transit-oriented development

Sidewalks wide enough to accommodate expected pedestrian flows

The location of bus stops, passenger loading areas, taxi stands, shuttle stops should not block sidewalks, obstruct traffic signals or be obscured from view of motorists, bicyclists or pedestrians



APPENDIX A-5

LAST MILE AND AMENITIES CHECKLIST

Checklist for the Evaluation of Transit Hub Connectivity		
LAST MILE CONNECTING SERVICES		
Yes	No	
Overall Approach		
<input type="checkbox"/>	<input type="checkbox"/>	Customer information regarding the availability of last mile services is provided.
<input type="checkbox"/>	<input type="checkbox"/>	Data to document customer needs and preferences is or will be collected.
<input type="checkbox"/>	<input type="checkbox"/>	Start-up and ongoing funding has been identified.
<input type="checkbox"/>	<input type="checkbox"/>	Service standards and benchmarks have been established.
<input type="checkbox"/>	<input type="checkbox"/>	Local land use planning efforts are or will be coordinated.
Shuttle service standards and benchmarks		
<input type="checkbox"/>	<input type="checkbox"/>	A manager or managing agency to help develop new or expand shuttle services has been identified.
<input type="checkbox"/>	<input type="checkbox"/>	Partnerships between public agencies, non-profits or private organizations to secure dedicated funding sources have been or are being created.
<input type="checkbox"/>	<input type="checkbox"/>	Transit operators are active partners with shuttle providers in order to coordinate and complement existing or proposed fixed-route service connections.
<input type="checkbox"/>	<input type="checkbox"/>	The shuttle service has been designed to incorporate new technologies, convenient connections and customer amenities.
<input type="checkbox"/>	<input type="checkbox"/>	A specific shuttle stop has been located and a shuttle stop sign installed.

Checklist for the Evaluation of Transit Hub Connectivity		
LAST MILE CONNECTING SERVICES		
Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	New shuttle services have been marketed and advertised to help build public awareness and ridership.
Pedestrian access standards and benchmarks		
<input type="checkbox"/>	<input type="checkbox"/>	A pedestrian circulation plan has been prepared as part of an overall transportation system.
<input type="checkbox"/>	<input type="checkbox"/>	The circulation plan addresses access between the transit hub and downtown areas, regional facilities, residential neighborhoods, business, community and government centers via safe and secure pedestrian pathways.
<input type="checkbox"/>	<input type="checkbox"/>	The plan may consider the establishment of pedestrian districts that provide policy and performance measures in those districts.
<input type="checkbox"/>	<input type="checkbox"/>	The pedestrian access performance measures may include but are not limited to major intersections, crossing frequency, land use intensity, land use mix, interface with parking lots and structures and connecting transit.
<input type="checkbox"/>	<input type="checkbox"/>	The circulation plan includes a wayfinding sign program that supports local needs and regional transit connectivity objectives.
<input type="checkbox"/>	<input type="checkbox"/>	Pedestrian pathways should promote safety and security, enhance the quality of life, and should include amenities like benches, lighting, landscaping, and if possible public art from each of the four quadrants that surround a transit hub.
Bicycle access and parking standards and benchmarks		
<input type="checkbox"/>	<input type="checkbox"/>	A needs analysis has been prepared as part of a bicycle parking and circulation plan that addresses coordination with transit operators and local issues.
<input type="checkbox"/>	<input type="checkbox"/>	The bicycle plan identifies safe and secure regional bike pathways from each of the four quadrants that surround a transit hub.
<input type="checkbox"/>	<input type="checkbox"/>	Safe and secure bike pathways have been installed, are integrated with regional bike facilities and include a wayfinding sign program.
<input type="checkbox"/>	<input type="checkbox"/>	Employers have been encouraged to promote bicycle commuting by installing bicycle amenities on-site for their employees.

Taxi service standards and benchmarks		
<input type="checkbox"/>	<input type="checkbox"/>	New taxi services coordinate connections between transit and taxi operators.
<input type="checkbox"/>	<input type="checkbox"/>	Licensing rules have been established at transit hubs to ensure orderly service connections.
<input type="checkbox"/>	<input type="checkbox"/>	A taxi stop has been located to assist customers and minimize conflicts with other transit service stops.
<input type="checkbox"/>	<input type="checkbox"/>	A public telephone or direct dial phone has been installed to enhance convenience for potential taxi users.
Alternative commute modes standards and benchmarks		
<input type="checkbox"/>	<input type="checkbox"/>	New or expanded electric vehicle, guaranteed-ride home, station car and carsharing alternatives have been encouraged and marketed.
<input type="checkbox"/>	<input type="checkbox"/>	Customer information and contact telephone numbers have been posted at regional hubs as apart of regional transit information.
<input type="checkbox"/>	<input type="checkbox"/>	Alternative commute modes have been promoted in the context of global warming issues as a way of potentially generating new funding sources and partnerships.
<input type="checkbox"/>	<input type="checkbox"/>	Businesses and non-profit organizations have been encouraged to advertise these alternative mode services at the regional transit hubs.

Checklist for the Evaluation of Transit Hub Connectivity HUB AMENITIES AND INFRASTRUCTURE IMPROVEMENTS		
Yes	No	
Connectivity		
<input type="checkbox"/>	<input type="checkbox"/>	There are no barriers that impede pedestrian flow in making connections at the hub.
<input type="checkbox"/>	<input type="checkbox"/>	Walking distances between loading platforms are short enough to accommodate passengers making timed-transfers between services.
<input type="checkbox"/>	<input type="checkbox"/>	Fare gates, escalators, elevators and stairways are adequate to accommodate pedestrian flow into and out of the hub and between transit services.
Weather protection		
<input type="checkbox"/>	<input type="checkbox"/>	Weather protection is provided at all loading areas including bus stops, rail platforms, taxi stands and shuttle stops.
<input type="checkbox"/>	<input type="checkbox"/>	Weather protection is provided along routes used to make connections between transit modes.
<input type="checkbox"/>	<input type="checkbox"/>	Weather protection is designed to protect customers from wind and driving rain.
Seating areas		
<input type="checkbox"/>	<input type="checkbox"/>	Ample seating is provided in close proximity to passenger loading areas.
<input type="checkbox"/>	<input type="checkbox"/>	Passenger seating is protected from wind and rain.
<input type="checkbox"/>	<input type="checkbox"/>	Passenger seating is clean and in good repair.
<input type="checkbox"/>	<input type="checkbox"/>	Lean-on railings are provided to supplement other passenger seating.
Audio announcements/Information		
<input type="checkbox"/>	<input type="checkbox"/>	Audio announcements are made in the transit hub to inform passengers of upcoming arrivals, changes in loading platforms or service delays.
<input type="checkbox"/>	<input type="checkbox"/>	Audio announcements are clear and loud enough to be heard and understood by customers.
<input type="checkbox"/>	<input type="checkbox"/>	Operators that provide hub service have coordinated customer service hours.

Restrooms		
<input type="checkbox"/>	<input type="checkbox"/>	Restrooms are provided at the transit hub.
<input type="checkbox"/>	<input type="checkbox"/>	The location of restrooms is clearly marked.
<input type="checkbox"/>	<input type="checkbox"/>	Restrooms are clean and safe for passenger use.
<input type="checkbox"/>	<input type="checkbox"/>	Temporary facilities are provided when restrooms are closed for maintenance or security reasons.
Security		
<input type="checkbox"/>	<input type="checkbox"/>	Security guards, transit police or other security personnel are present during all hours of hub operation.
<input type="checkbox"/>	<input type="checkbox"/>	Security guards, transit police or other security personnel are present during early morning and late evening hours.
<input type="checkbox"/>	<input type="checkbox"/>	Video surveillance equipment is used to enhance security at the hub.
<input type="checkbox"/>	<input type="checkbox"/>	Emergency call boxes are provided at locations within the hub and at the perimeter.



APPENDIX A-6 HUB ACTIVITY SURVEY

The hub activity survey is a data collection technique designed to provide a count of the total number of persons using a hub and the number of persons transferring from one transit line or route to another. This type of survey is a useful tool for monitoring hub operations and planning hub improvements. The survey technique was initially developed for BART to assess BART/bus and bus/bus transfer activities at BART stations. In some cases, these surveys were conducted before and after bus transfer center improvements were implemented. A detailed description of the procedures used in conducting these surveys is presented below including sample data collection forms. Guidelines for use of the results will follow.

SURVEY PROCEDURES

The procedures developed to survey hub activity were designed to ensure that results were representative of activities occurring at the station. The specific design of the survey procedures will depend upon the transit activity at the station and what information about transfers is desired. For example, is the important link(s) from bus to bus, bus to train, or bus to ferry? For all surveys, regardless of the transit modes and operators represented, it is critical to the accuracy of the data that the following procedures be utilized:

- Collect data during the desired time period;
- Survey a consistent directional flow so as not to double-count during specific time periods;
- Provide an adequate sample size to meet the goal of the survey; and
- Provide accurate control counts of hub activity.

Survey Time Period

Before designing the survey, it is important to establish what time period is the focus of the data needed. Is hub activity information needed during commute, midday, weekend, holiday or special event periods? The BART surveys were intended to collect transit transfer information for typical weekday traffic and so were conducted on a typical weekday (Tuesday, Wednesday or Thursday) during a non-holiday week. Summer months, holiday periods and rainy days were avoided both for the comfort of the surveyors, in the case of rainy days, and to prevent collecting non-typical results. The survey hours were from 6:00 AM to 12 noon and from 2:00 PM to 7:00 PM. These times were selected to provide data during the most active hours of the day while allowing a much-needed break for the team of surveyors. Data was recorded for each 15-minute period.

Survey Directional Flow

Surveys should be conducted of transit passengers either exiting or entering vehicles so as to avoid double-counting the transfer data. In the example of the BART survey, bus riders were interviewed

as they exited buses arriving at the station. Each person was asked whether he or she were transferring from the bus to BART, to another specific bus route, or whether they were walking directly to a destination near the station. If loading platforms are located in close proximity, it may not be necessary to directly interview passengers; transfer information can be obtained through observation only. By conducting the surveys during the most active hours of the day, it was possible to collect data on both directions of most trips.

Sample Size

It is important to collect an adequate sample size to insure the validity of the survey. For the BART survey, the goal was to collect a 50 percent sample of exiting bus riders; the actual collected sample was significantly greater with most survey samples exceeding 90 percent. The difficulty of collecting an adequate sample size will be dependent upon how many surveyors can be provided within survey budgetary constraints, how frequently vehicles arrive, how many passengers are exiting each vehicle and how many vehicles arrive at the same time or within minutes of each other. Hubs functioning under pulse schedules may require a greater number of surveyors than hubs with vehicles arriving at evenly spaced intervals. It will be beneficial to get volumes of passenger arrivals/departures and route schedule information to aid in determining the survey schedule and number of survey personnel needed.

Control Counts

To arrive at an accurate representation of activity at the hub and to estimate the percentage of transfers from one transit line or route to another, it is necessary to collect counts of boardings and alightings for each arriving vehicle. Some of this information may be available automatically through fare box accounting as in the case of BART; for others, this information will need to be manually counted. For the BART survey, it was most effective to designate certain personnel for on/off counts while others were used to collect transfer count.

Survey Forms

The forms used to conduct the survey were designed to streamline the data collection process. Prior to the survey taking place, a station site visit was made to confirm the location of bus stops and customize the sheets as needed. The following sample survey forms are included below:

2. On/Off Count Sheet – This form was used to collect the control count of boardings and alightings for each bus route.
3. Transfer Sheet – A separate transfer form was used for each bus route to collect the number of people exiting that route and transferring to BART, other bus routes or leaving the station on foot.
4. On/Off Summary Sheet – Summary of observed bus information and number of transfer interviews.
5. Bus Transfer Summary – Summary of Bus/BART and Bus/Bus transfers for the survey time period.

SURVEY DESIGN CONSIDERATIONS

To insure that the survey goes smoothly and that the results are accurate, the survey design should consider the following issues:

Station security – Transit hub operator and security personnel should be alerted well in advance of the actual survey date. Station agents that will be on duty during the survey period should be made aware that the survey will be taking place. Security procedures or requirements required by the transit hub operator should be incorporated into the procedures provided to survey personnel.

Passenger safety – Performance of the survey should not compromise the safety or access of passengers. Notice that a survey is currently in progress should be clearly posted in the hub. It is also beneficial to provide similar announcements several days prior to the survey actually taking place. Survey personnel should be clearly identified with nametags and distinguishable vests or shirts.

Language barriers – Transfer surveys conducted at hubs in multi-lingual communities may require survey personnel to be conversant in the languages of the communities. This is especially important at hubs where interviews are required to collect transfer data. Survey signage should also be in the necessary languages to be effective.

USING THE DATA

The hub activity survey will provide the hub operator with information about how many passengers are using the hub, the hours of peak hub activity and what transfers are being made. This information can be used to:

Determine the most efficient layout of loading areas by locating loading areas with the heavier transfer activity in close proximity. This will provide more convenience for the greater number of passengers and can contribute to improved schedule adherence.

Prioritize scheduling of timed transfers between transit routes. It is often difficult to provide convenient timed-transfers between all routes at a transit hub. The routes with the greatest volumes of transfer activity should be prioritized for timed transfers thereby improving connectivity for the greater number of passengers.

Determining the peak hours of operation and peak passenger volumes. This information can assist hub operators in determining when additional station agents are needed, when maintenance activities would be least intrusive and when additional ticket machines or fare gates are needed.

Assessing if facilities are adequate to handle the number of transit vehicles using the hub.

Determine passenger volumes and flows during off-peak hours to ensure that high levels of passenger safety are provided at all times.

Bus Transfer Survey - On/Off Count

Pleasant Hill BART Station
BART Station Access Evaluation Study

Tuesday, 10/2/01

	FST 40			CC 107			CC 109			CC 111			CC 114			CC 115			CC 116			BT VBP			BT Flyer		
TIME	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON
6:00-6:14	1	0	0	1	3	8	1	5	6	1	0	0	1	OS	3	1	7	1	1	6	0	1	0	3			
6:15-6:29				1	4	8				1	2	2	1	0	1	2	4	5									
6:30-6:44	1	22	0							1	8	1	1	28	3	1	3	9	2	5	13				2	31	0
6:45-6:59							1	0	11				1	21	3	2	13	14				1	2	2			
1 hr TOTAL	2	22	0	2	7	16	2	5	17	3	10	3	4	49	10	6	27	29	3	11	13	2	2	5	2	31	0
7:00-7:14	1	20	2	1	0	17	1	8	18	2	12	1	1	34	4				3	25	37	1	5	0			
7:15-7:29				1	8	30				1	3	0				2	16	45				1	16	1			
7:30-7:44							1	10	16	1	6	1	1	23	1										1	5	0
7:45-7:59				1	4	16	1	12	5	2	10	5	1	14	2	1	14	15	2	8	15						
1 hr TOTAL	1	20	2	3	12	63	3	30	39	6	31	7	3	71	7	3	30	60	5	33	52	2	21	1	1	5	0
8:00-8:14										1	1	6	1	17	8	2	2	5				1	16	1			
8:15-8:29	1	15	4	1	2	9	1	7	7	1	1	0	1	18	0	1	2	2	2	9	20	1	1	0	1	3	5
8:30-8:44				1	3	15	1	3	3				1	13	1	3	17	1							1	2	0
8:45-8:59							1	1	8	2	5	2				2	2	14	2	7	7	1	4	1			
1 hr TOTAL	1	15	4	2	5	24	3	11	18	4	7	8	3	48	9	8	23	22	4	16	27	3	21	2	2	5	5
9:00-9:14				1	0	G				1	0	1							1	4	1	1	1	6			
9:15-9:29										1	3	1	1	4	0												
9:30-9:44				1	2	0							1	13	3	2	7	0	2	12	9						
9:45-9:59				1	3	7	1	5	8				1	3	0	3	10	11	1	3	2						
1 hr TOTAL	0	0	0	3	5	7	1	5	8	2	3	2	3	20	3	5	17	11	4	19	12	1	1	6	0	0	0
10:00-10:14																1	5	8	2	11	3	1	1	2			
10:15-10:29										1	3	0	1	12	5	1	0	3									
10:30-10:44							1	4	8	1	0	5	1	4	4	1	1	1	1	4	3						
10:45-10:59													1	4	5				2	11	6	1	5	0			
1 hr TOTAL	0	0	0	0	0	0	1	4	8	2	3	5	3	20	14	3	6	12	5	26	12	2	6	2	0	0	0
11:00-11:14				1	3	16				1	4	1	1	10	6	1	3	8									
11:15-11:29							1	7	8	1	3	0	1	3	1				1	5	1						
11:30-11:44																2	5	6	1	3	5						
11:45-11:59							1	3	?	1	0	0	1	6	?	1	2	1	2	6	10	1	3	?			
1 hr TOTAL	0	0	0	1	3	16	2	10	8	3	7	1	3	19	7	4	10	15	4	14	16	1	3	0	0	0	0
AM TOTAL	4	57	6	11	32	126	12	65	98	20	61	26	19	227	50	29	113	149	25	119	132	11	54	16	5	41	5

	FST 40			CC 107			CC 109			CC 111			CC 114			CC 115			CC 116			BT VBP			BT Flyer		
TIME	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON	BUS	OFF	ON
2:00-2:14							1	0	3	2	3	2	2	5	7	2	10	10	1	5	4						
2:15-2:29				1	6	6				1	G	2				1	0	2	1	4	5						
2:30-2:44							1	10	7	1	3	2	1	6	6	1	0	2	1	0	4						
2:45-2:59				1	11	1										1	0	1	1	5	6	1	2	3			
1 hr TOTAL	0	0	0	2	17	7	2	10	10	4	6	6	3	11	13	5	10	15	4	14	19	1	2	3	0	0	0
3:00-3:14							2	19	13	1	3	5	2	15	14	1	12	0									
3:15-3:29																1	8	17	3	17	11						
3:30-3:44				1	6	6				1	8	6	1	6	19												
3:45-3:59																2	77	12	1	3	7	1	5	20			
1 hr TOTAL	0	0	0	1	6	6	2	19	13	2	11	11	3	21	33	4	97	29	4	20	18	1	5	20	0	0	0
4:00-4:14	1	3	9	1	21	8	1	19	16	2	5	18	1	9	33	1	3	7	1	11	5						
4:15-4:29							2	9	10	1	5	10	1	7	18	3	28	15	1	2	4				1	0	8
4:30-4:44				1	12	4							1	7	13	2	5	3									
4:45-4:59	1	1	6				1	5	7	1	6	4	1	2	23	1	9	6	1	10	18						
1 hr TOTAL	2	4	15	2	33	12	4	33	33	4	16	32	4	25	87	7	45	31	3	23	27	0	0	0	1	0	8
5:00-5:14				1	0	2				1	2	8				3	11	12	1	12	0	1	2	19			
5:15-5:29	1	1	6	1	16	4	1	6	9				1	8	7	2	10	12							1	0	11
5:30-5:44							1	6	4	1	3	2	1	4	12	1	0	5	2	11	20						
5:45-5:59				1	9	4	1	3	5	1	0	13	1	2	11												
1 hr TOTAL	1	1	6	3	25	10	3	15	18	3	5	23	3	14	30	6	21	29	3	23	20	1	2	19	1	0	11
6:00-6:14				1	4	0	1	3	5	1	0	1				2	1	12	2	10	2	1	0	17			
6:15-6:29				1	0	0				1	0	OS	1	2	6	1	2	7	2	4	10				1	0	4
6:30-6:44	1	1	4	1	4	4	1	2	8				1	0	14	1	0	2	2	6	5						
6:45-6:59							1	0	1	1	0	6				2	3	7	1	3	1						
1 hr TOTAL	1	1	4	3	8	4	3	5	14	3	0	7	2	2	20	6	6	28	7	23	18	1	0	17	1	0	4
PM TOTAL	4	6	25	11	89	39	14	82	88	16	38	79	15	73	183	28	179	132	21	103	102	4	9	59	3	0	23
11 HR TOTAL	8	63	31	22	121	165	26	147	186	36	99	105	34	300	233	57	292	281	46	222	234	15	63	75	8	41	28

FST = Fairfield-Suisun Transit CC = County Connection BT VBP = Benicia Transit Vallejo/Benicia/PH BT = Benicia Transit

Bus Transfers from Bus 114 County Connection

Pleasant Hill BART Station BART Station Access Evaluation Study

Tuesday, 10/2/01

TIME	BART	FST 40	CC 107	CC 109	CC 111	CC 114	CC 115	CC 116	BT VBP	BT FLYER	WTD	TI
6:00-6:14												0
6:15-6:29												0
6:30-6:44	20						1	3			3	27
6:45-6:59	13						2	6				21
1 hr TOTAL	33	0	0	0	0	0	3	9	0	0	3	48
7:00-7:14												0
7:15-7:29	26			5			3					34
7:30-7:44	18			3				2				23
7:45-7:59												0
1 hr TOTAL	44	0	0	8	0	0	3	2	0	0	0	57
8:00-8:14	15						1				2	18
8:15-8:29	15			1			1				1	18
8:30-8:44	10			3								13
8:45-8:59	10						3				1	14
1 hr TOTAL	50	0	0	4	0	0	5	0	0	0	4	63
9:00-9:14												0
9:15-9:29	3							1				4
9:30-9:44	9							4				13
9:45-9:59												0
1 hr TOTAL	12	0	0	0	0	0	0	5	0	0	0	17
10:00-10:14				1				2				3
10:15-10:29	6							5			1	12
10:30-10:44	3										1	4
10:45-10:59	4											4
1 hr TOTAL	13	0	0	1	0	0	0	7	0	0	2	23
11:00-11:14	4			3			3					10
11:15-11:29												0
11:30-11:44	1							2				3
11:45-11:59												0
1 hr TOTAL	5	0	0	3	0	0	3	2	0	0	0	13
AM TOTAL	157	0	0	16	0	0	14	25	0	0	9	221
TIME	BART	FST 40	CC 107	CC 109	CC 111	CC 114	CC 115	CC 116	BT VBP	BT FLYER	WTD	TI
2:00-2:14	1					2	1				1	5
2:15-2:29												0
2:30-2:44	2						1	2			1	6
2:45-2:59												0
1 hr TOTAL	3	0	0	0	0	2	2	2	0	0	2	11
3:00-3:14	11			2							2	15
3:15-3:29												0
3:30-3:44	4							2				6
3:45-3:59												0
1 hr TOTAL	15	0	0	2	0	0	0	2	0	0	2	21
4:00-4:14	8										1	9
4:15-4:29	6										1	7
4:30-4:44	4			1				2				7
4:45-4:59								1			1	2
1 hr TOTAL	18	0	0	1	0	0	0	3	0	0	3	25
5:00-5:14												0
5:15-5:29	3							2			3	8
5:30-5:44	1							1			2	4
5:45-5:59								1			1	2
1 hr TOTAL	4	0	0	0	0	0	0	4	0	0	6	14
6:00-6:14												0
6:15-6:29											2	2
6:30-6:44												0
6:45-6:59												0
1 hr TOTAL	0	0	0	0	0	0	0	0	0	0	2	2
PM TOTAL	40	0	0	3	0	2	2	11	0	0	15	73
11 HR TOTAL	197	0	0	19	0	2	16	36	0	0	24	294
PT	67%	0%	0%	6%	0%	1%	5%	12%	0%	0%	8%	100%

FST = Fairfield-Suisun Transit CC = County Connection BT VBP = Benicia Transit Vallejo/Benicia/PH
BT = Benicia Transit WTD = Walked to Destination TI = Total Interviewed PT = Percent Transfer

Buses On/Off Count Summary - 6:00 AM to 12:00PM and 2:00 PM to 7:00 PM

Pleasant Hill BART Station
BART Station Access Evaluation Study - Bus Transfer Study
 Tuesday, 10/2/2001

BUS ROUTE	Total Observed Bus Information				Interviewed Bus Riders		
	Number of Buses	OFF's	ON's	Ridership	Total Interviewed	Percent of OFF's	Percent Transfer to BART
Fairfield-Suisun Transit 40	8	63	31	94	57	90%	72%
County Connection 107	22	121	165	286	111	92%	72%
County Connection 109	26	147	186	333	145	99%	70%
County Connection 111	36	99	105	204	99	100%	51%
County Connection 114	34	300	233	533	294	98%	67%
County Connection 115	57	292	281	573	280	96%	56%
County Connection 116	46	222	234	456	214	96%	65%
Benicia Transit Vallejo/Benicia/PH	15	63	75	138	59	94%	93%
Benicia Transit Benicia Flyer	8	41	28	69	39	95%	90%
TOTAL	252	1,348	1,338	2,686	1,298	96%	66%

Bus Transfer Summary - 6:00 AM to 12:00PM and 2:00 PM to 7:00 PM

Pleasant Hill BART Station
BART Station Access Evaluation Study - Bus Transfer Study
 Tuesday, 10/2/2001

FROM BUS ROUTE / TRANSFER TO	BART	Fairfield-Suisun Transit 40	County Connection						Benicia Transit		Walked to Destination
			107	109	111	114	115	116	Vallejo/ Benicia	Benicia Flyer	
Fairfield-Suisun Transit 40	41	-	-	-	-	1	1	1	-	-	13
County Connection 107	80	-		5	5	6	7	1	-	-	7
County Connection 109	101	-	1	-	5	16	4	1	-	-	17
County Connection 111	50	-	1	2		17	10	8	-	-	11
County Connection 114	197	0	0	19	0	2	16	36	0	0	24
County Connection 115	157	1	2	13	17	42	0	8	1	0	39
County Connection 116	139	0	2	5	2	45	7	0	1	0	13
Benicia Transit Vallejo/Benicia/PH	55	0	0	0	0	1	2	1	0	0	0
Benicia Transit Benicia Flyer	35	0	0	0	0	0	2	0	0	0	2
TOTAL	855	1	6	44	29	130	49	56	2	0	126



APPENDIX A-7 HUB SCHEDULE ADHERENCE SURVEY

A hub schedule adherence survey can be used to help coordinate and improve transfer operations through evaluation of how well schedules are being met at the hub. Transit schedules are valuable for both passengers and transit operators in making travel plans, making transit connections and providing convenient timed-transfers. However, transit service that is not meeting the fixed schedules and is consistently late because of traffic delays, vehicle breakdowns or other factors does not benefit anyone. Although it is expected that occasional delays will occur, a transit route that is late more often than not will not attract new riders or keep existing riders for long. Setting a realistic schedule is important to providing good transit service.

A schedule adherence survey collects actual arrival and departure times for each transit route or line. Additional information about time for exiting vehicles, walking between transfers and boarding vehicles may also be collected. With limited extra work, the schedule adherence information can be collected at the same time as the hub activity survey is conducted. For best results, the survey should be conducted during typical conditions and should avoid holidays, rainy days, and events that will affect surrounding traffic flows such as roadway construction or severe accidents. In addition, the survey should be conducted on multiple days to get an indication of typical schedule performance.

By comparing the actual arrival and departure times to the fixed schedules it is possible to identify and evaluate the following issues related to schedule adherence:

- Which routes are consistently late;

- How much and how often is scheduled layover time used to maintain schedules;

- Which timed-transfers are consistently affected by schedule delays; and

- Time needed for transfers including time for exiting one vehicle, walking between vehicles, and boarding.